Extreme weather risks to maritime activities

Case study 3

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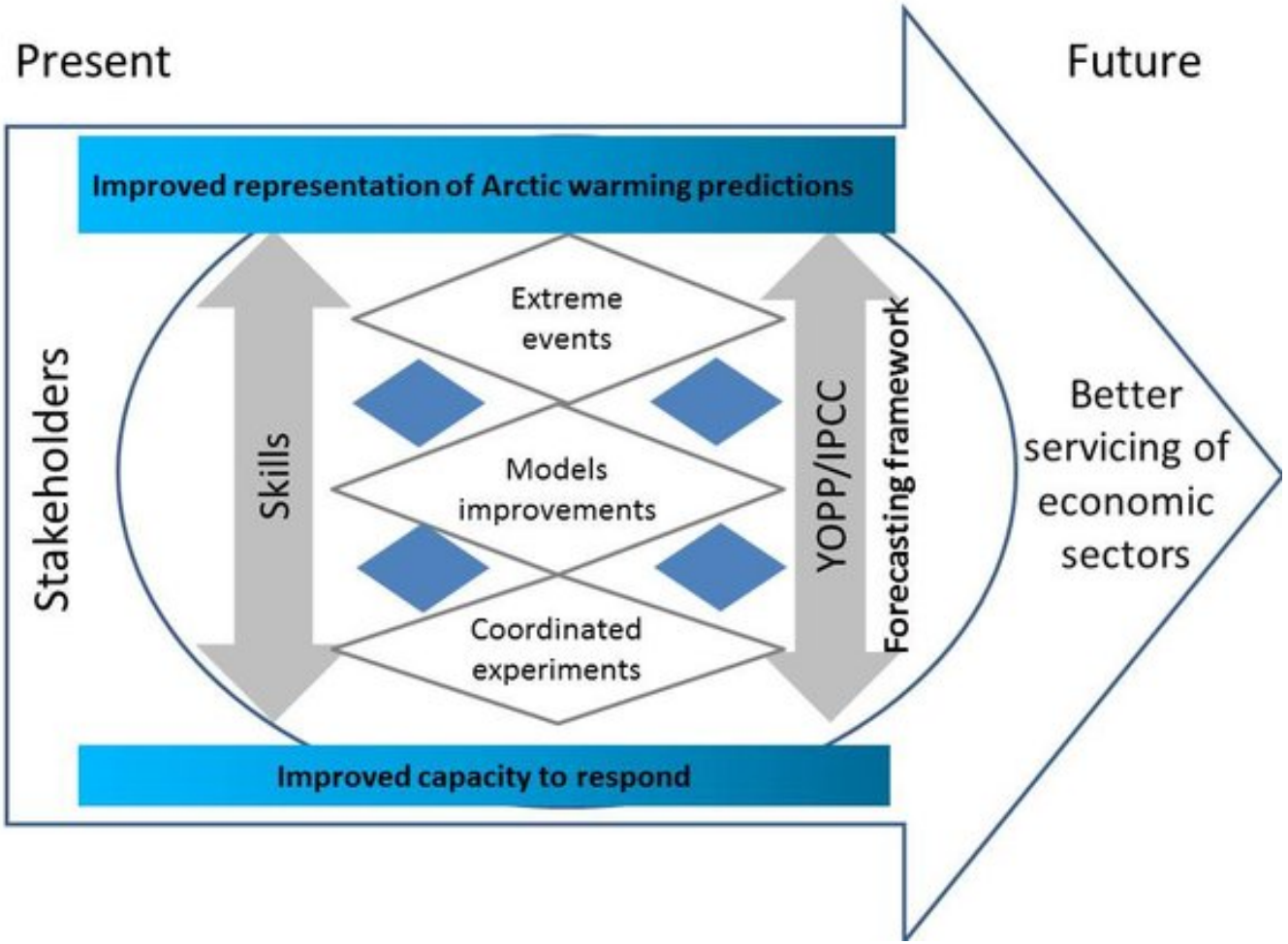
Photo credit: SAMS

Case study objectives

- Investigate predictability of extreme weather events associated with marine cold air outbreaks in the Arctic
- Understand the linkages between a changing Arctic and its' connotations to climate variability
- Identify how improved forecasts can be used to mitigate risks of operating in polar waters

Adapting for **blue growth** and a “climate economy”

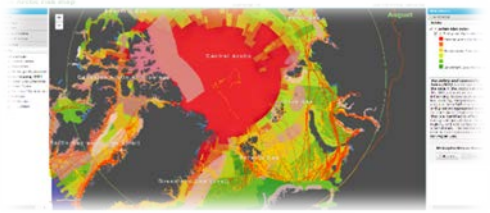


Stakeholder engagement

Scoping of stakeholder and end-user requirements

Development of climate services

Dissemination of products/end-user workshop on polar lows prediction

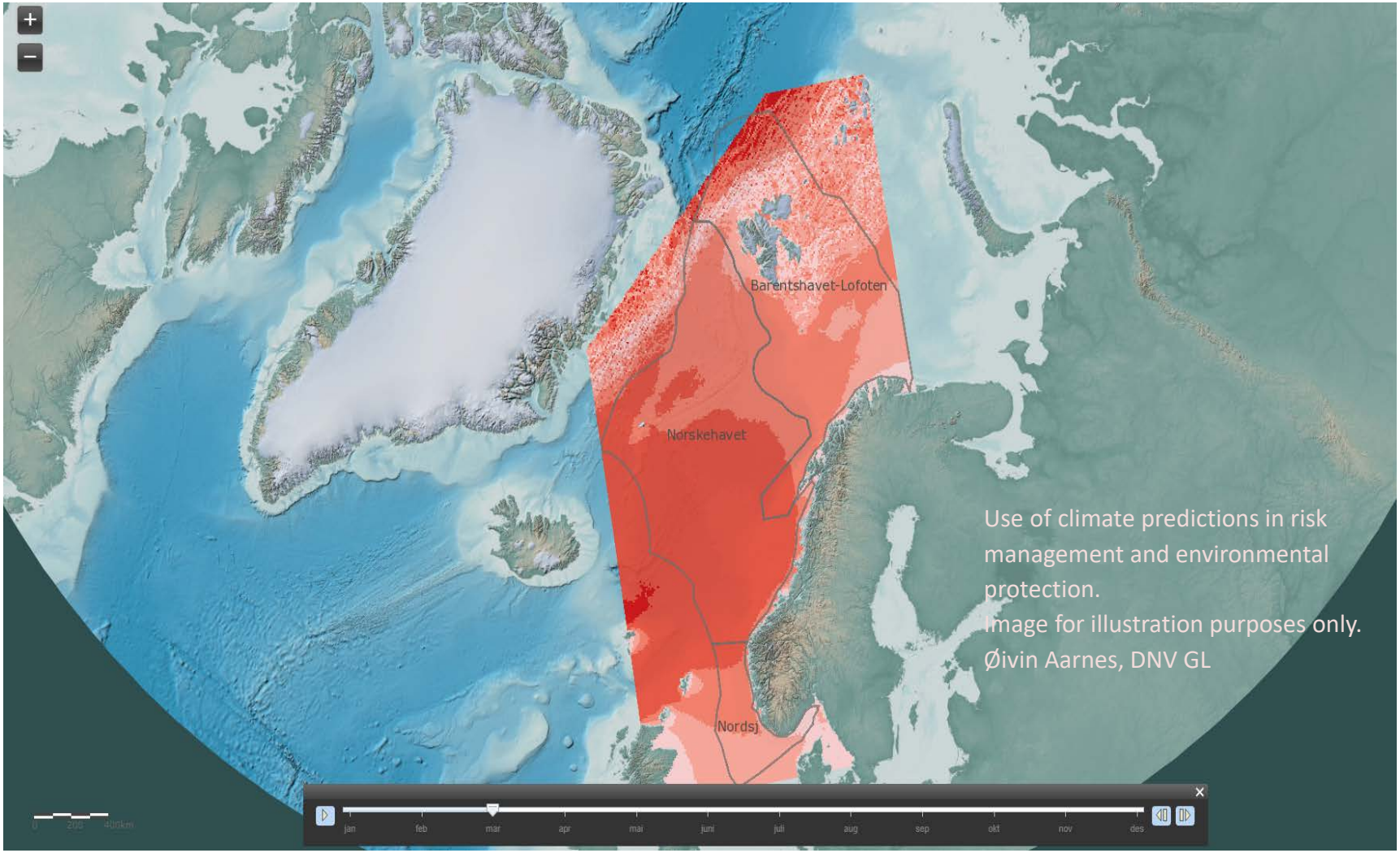


Tailoring a *climate service* for storm readiness

- Requirements specification
  - Who are the users
  - What are the needs
  - What information
  - When and how

- Weighing the benefits
  - Risk advisory
  - Mitigation strategies
  - Search and rescue capacity
  - Timely, spatial, and accurate information

Delineate a relationship between climate effects (MCAOs) and risks to maritime operations



Use of climate predictions in risk management and environmental protection.
Image for illustration purposes only.
Øivin Aarnes, DNV GL

Recognizing a changing Arctic

The cryosphere – a barometer of climate change

…and adapting to a future climate

Impact of climate change and extreme waves on tanker design, DNV GL report 2015

Polar operations – New IMO Polar Code from 1st January 2017

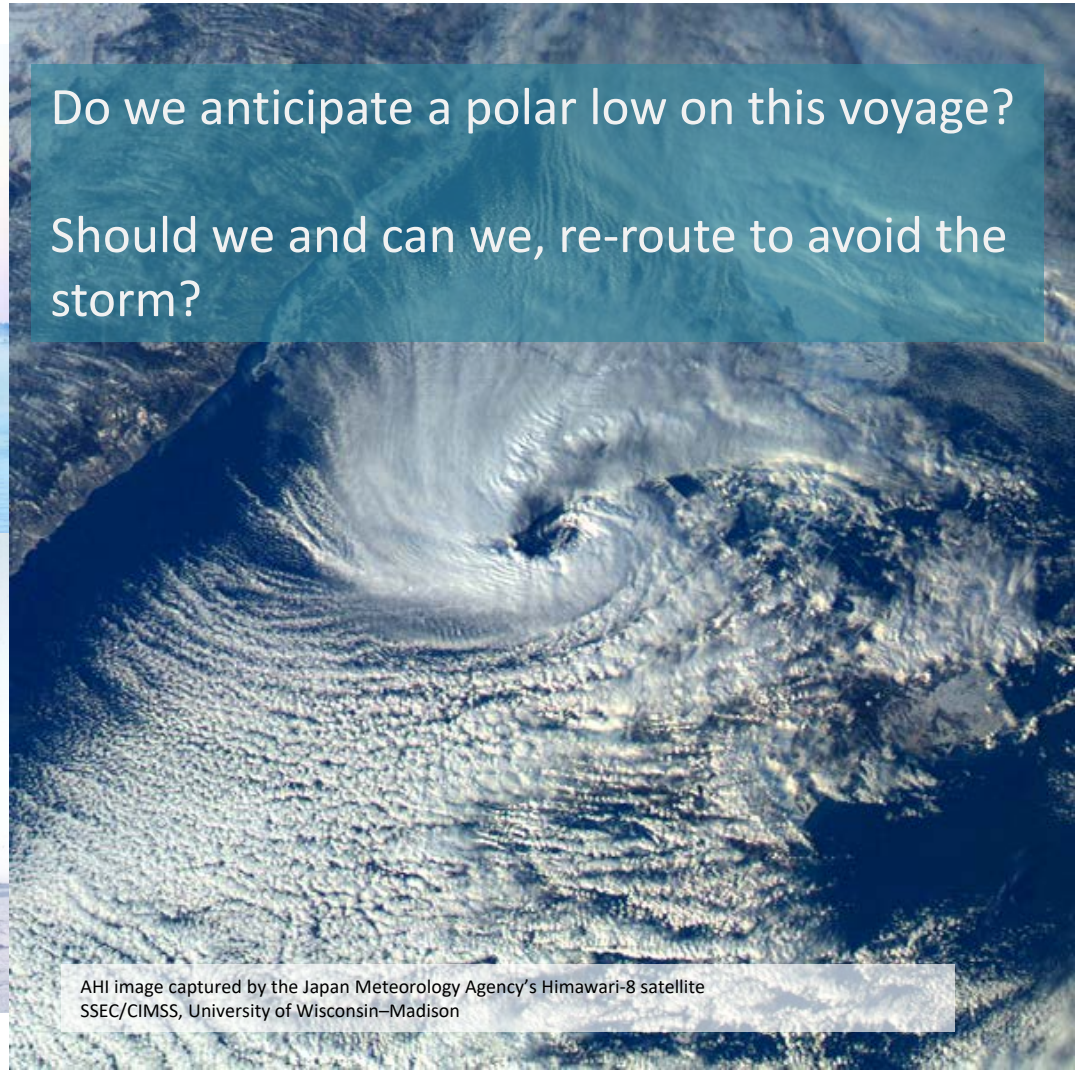
Limitations to operations are defined by:

- Vessels Ice Class – actual ice condition
- Polar Service Temperature (PST)
- Level of Winterization
- Possible other design limitations

Purpose of The Code: To identify ship specific operational limitations, and make owner and crew aware of these.

However, it is always the responsibility of the Master to ensure that the vessel operates within these limits!

Impact of polar lows in trans-Arctic shipping



Do we anticipate a polar low on this voyage?

Should we and can we, re-route to avoid the storm?

AHI image captured by the Japan Meteorology Agency's Himawari-8 satellite
SSEC/CIMSS, University of Wisconsin–Madison

Trans-Arctic shipping

A feasible option in 2030-2050?

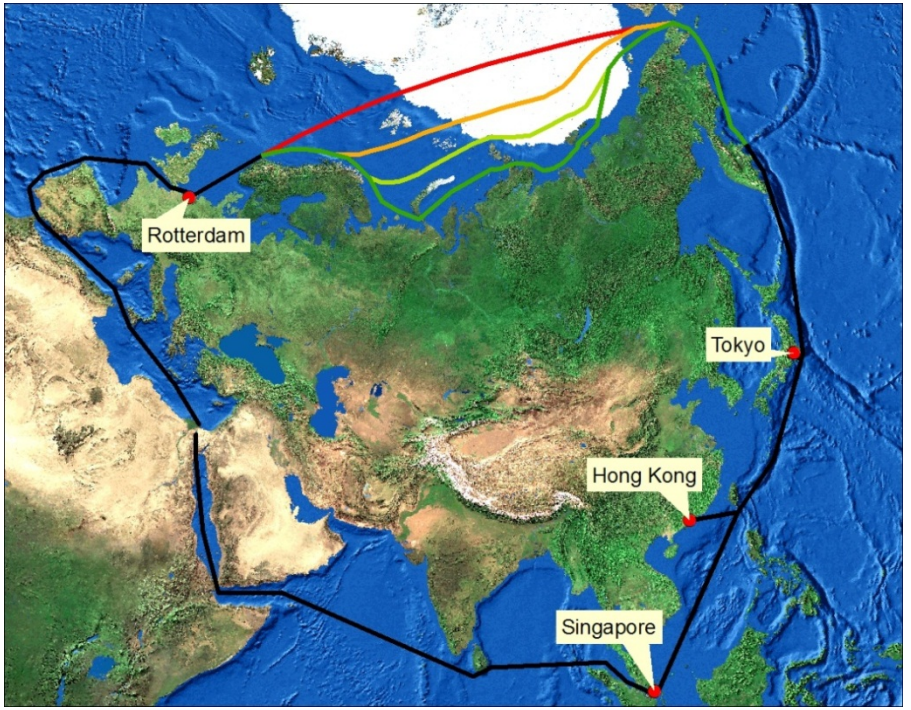
By 2030, part-year traffic from Tokyo hub will be competitive. *

In 2050, Tokyo hub will be profitable for part-year operation and may become profitable also with year-round sailing for bunker prices above $900/tonne.*

Trans-polar shipping from central ports in Asia is likely to become marginally profitable only with high bunker prices and a long summer sailing season in 2050.

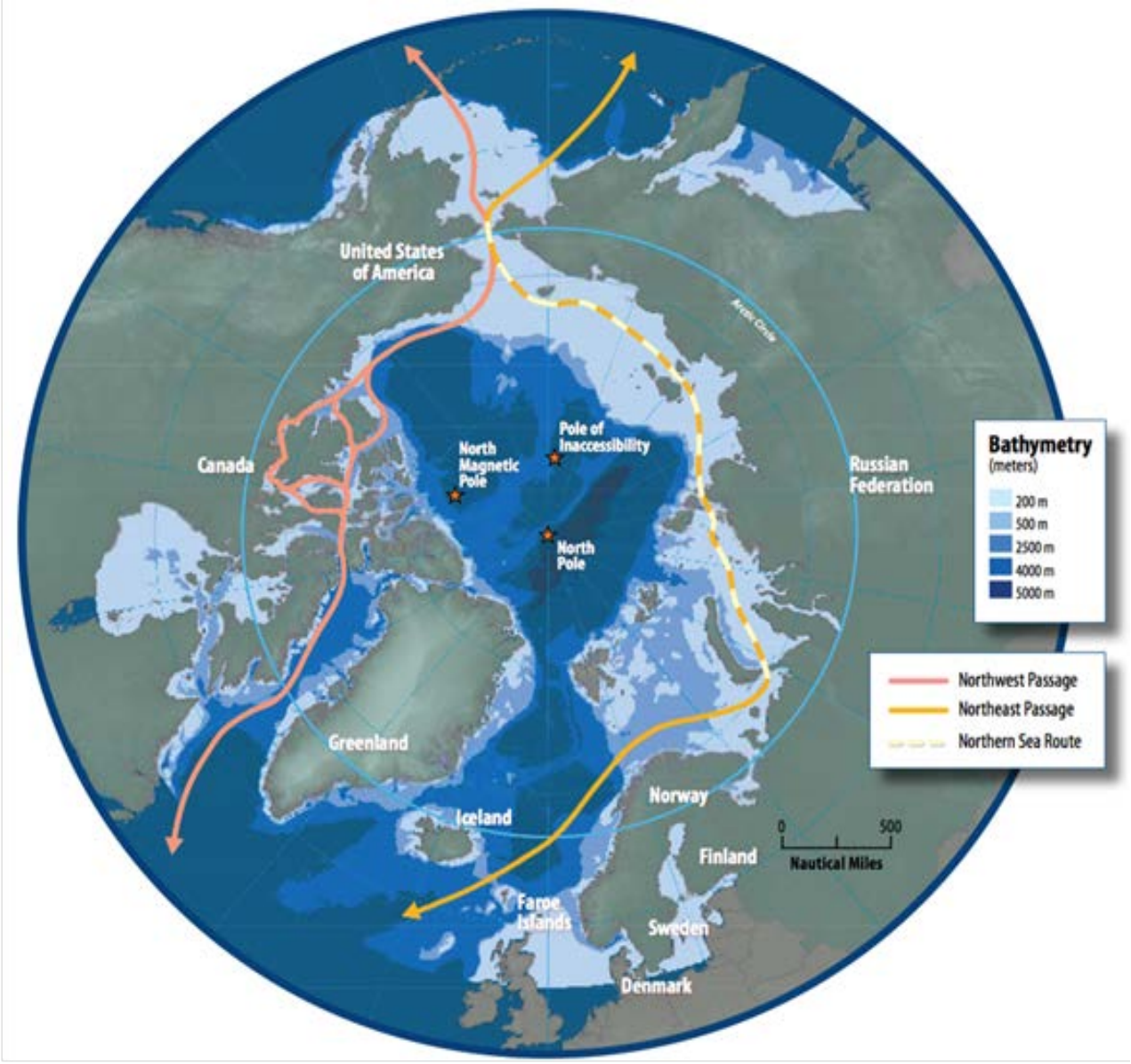
Traffic across the Arctic from the southern ports in Asia (Singapore hub) will not be profitable due to a longer sailing route than via Suez.

Using a trans-polar route may reduce global CO_2 emissions from ships by roughly 0.1% in 2030 and 0.15% in 2030 and 2050, respectively.



* According to a DNV GL study of 2012

Which is more viable, and which is more sustainable?



Climate resilient pathways

Climate-resilient pathways are development trajectories that combine mitigation and adaptation strategies to realize the goal of sustainable development

Business action to climate change

Business climate action refers to the actions taken by business to reduce and manage the risks of climate change

Key enablers

- Commitment to the UN Sustainable Development Goals and the Paris Agreement
- Integration of climate risks and opportunities into sustainability strategies and action
- In the strategy process, recognize social and environmental drivers to sustainable practice
- Recognize and embed socio-economic side effects into strategic planning
- Involvement of users, stakeholders, communities, and business
- Bilateral transparency between government, society, research, and business

Enabling blue-green growth

Sustainable management of the oceans

Protecting terrestrial ecosystems and upholding the livelihoods of indigenous communities

BLUE ACTION

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